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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/660,110

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EXAMINER

NEGIN, RUSSELL SCOTT

ART UNIT

PAPER NUMBER

1631

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/660,110	<b>Applicant(s)</b> OLDHAM ET AL.	
	<b>Examiner</b> RUSSELL S. NEGIN	<b>Art Unit</b> 1631	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 28 December 2009.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 20,33,45 and 56 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 20,33,45 and 56 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948)                        | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Comments***

Applicant's request for reconsideration in the communication filed on 28 December 2009 is acknowledged.

Claims 20, 33, 45, and 56 are pending and examined in the instant Office action.

### ***Withdrawn Rejections***

The rejections of claims 20, 33, 45, and 56 under 35 U.S.C. 103(a) as being unpatentable over Savory et al. [Clinical Chemistry, volume 14, 1968, pages 132-144] in view of Mori et al. [US Patent 3,422,738; issued 21 January 1969; filed 13 July 1965] as evidenced by Rentschler [US Patent 3,687,045; issued 29 August 1972; filed 27 November 1970] in view of Chen et al. [Genome Research, 1998, volume 8, pages 549-556] in view of Tacklind et al. [US PGPUB 2003/0101605; published 5 June 2003; filed 4 December 2001] are withdrawn in view of argument on pages 10-16 of the Remarks.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

The following rejection is NEWLY applied:

Claims 20, 33, 45, and 56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yang et al. [US Patent 6,369,737 B1; issued 9 April 2002; filed 30 October 1997] in view of Kiper [US Patent 3,439,535; issued 22 April 1969] in view of French et al. [US PG PUB 2001/0046673; published 29 November 2001; filed 25 January 2001].

The method of claims 20, 33, and 45 are drawn to improving the assessment of a plurality of types of specific particles in a sample using a photodetector that is a charge coupled device. This photodetector detects particles, each type of particle being labeled with a specific probe. Scaling is used between the two configurations of the photodetector to determine the signals out of the dynamic range of the photodetector in a specific configuration (the different independent claims are drawn to different specific signals that are out of range of the photodetector). Specifically, the scaling procedure

extends the dynamic range of each configuration of the photodetector by taking and using ratios relating exposure times to signal intensities. Claim 56 is further limiting wherein these ratios are directly applied to the fourth output signal.

The document of Yang et al. studies a method for converting a low dynamic range analog signal to a larger dynamic range floating-point digital representation.

The advantage of the invention of Yang et al. is that it widens the dynamic range on BOTH ends of the dynamic range by allowing for the quantization of both very strong and very weak signals through digitization of the signals that are not adequately represented in an analog system [see column 9, lines 48-57 of Yang et al.]. It is noted that the detectors used by Yang et al. are photodetectors [see Figure 10 and column 8, lines 43-48 of Yang et al.].

Attention is drawn to Figure 6 and column 9, line 58 to column 10, line 35 of Yang et al. Specifically, Figure 6 of Yang et al. and the accompanying text illustrate a strong signal obtained from a source (label "A") and a weak signal obtained from a different source (label "C"). In the first configuration (when the signal is evaluated at time  $T = T_3$ ), signal A exceeds the dynamic range of the detector while signal C is within the range of the detector. In the second configuration (when the signal is evaluated at time  $T = T_1$ ), signal A is within the dynamic range of the detector while signal C is below the legible range of the detector. It is noted that the respective evaluation times  $T_1$ ,  $T_2$ ,  $T_3$ , etc... are related by logarithmic factors of ten, and the abscissa of the plot demonstrates that the ratios of immediately successive times (i.e.  $T_2/T_1$ ) is always equal to ten. These "base 10" ratios are used to convert the ordinate analog signal axis from

the low value at the three time configurations of signal C (i.e. analog value of signal C- 0 at  $T_1$ , 0 at  $T_2$ , and 7 at  $T_3$ - is converted to a single digital value of  $7 \times 10^0$ ). These "base 10" ratios are also used to convert the ordinate analog signal axis from the high value at the three time configurations of signal A (i.e. analog value of signal A- 7 at  $T_1$ , 9 at  $T_2$ , and 9 at  $T_3$ - is converted to a single digital value of  $7 \times 10^2$ ). Consequently, Figure 6 and column 10, lines 11-35 of Yang et al. use ratios between successive time points to expand the dynamic range of an analog signal detector into a digital signal detector.

However, Yang et al. uses the same intensity range for each configuration. While Yang et al. uses photodetectors for signal detection (see Figure 10 and column 8, lines 43-48), Yang et al. does not use these photodetectors to detect the presence of particles labeled with probes. Yang et al. also does not use a CCD device.

The document of Kiper studies an exposure control device for cameras. Specifically, the abstract and background in column 1 of Kiper teaches that the camera/device is adaptable in that it has a higher range of intensities for better accuracy in high lit scenes; likewise, Kiper also teaches that the camera also has a low range for better accuracy in low lit scenes.

Yang et al. and Kiper do not use their photodetectors to detect the presence of particles labeled with probes. Yang et al. and Kiper also do not use a CCD device.

The document of French et al. studies a method and apparatus for detecting polymorphisms in nucleic acids [see title]. One of the techniques discussed in the abstract is FRET (fluorescence resonance energy transfer). Paragraph 276 of French et al. also describes fluorescence as a possible means to assay nucleic acids.

Paragraphs 337 and 353 of French et al. describe specific photodetectors used to assess the biomolecules, which include charge-coupled devices (CCDs).

It would have been obvious for someone of ordinary skill in the art at the time of the instant invention to modify the photodetector analysis of Yang et al. by use of the adjustable ranges of intensities when detecting image intensities as in the cameras of Kiper wherein the motivation would have been that tuning the range of light intensity increases the accuracy of the obtained data [see column 1, lines 40-49 of Kiper].

It would have been further obvious for someone of ordinary skill in the art at the time of the instant invention to modify the photodetector analysis of Yang et al. and the adjustable intensity ranges of Kiper by use of the photodetector analysis of probes and CCD cameras as described in French et al. because it is obvious to combine known elements in the prior art to yield a predictable result. In this instance, signals from fluorescently labeled particles are alternate forms of signals than the general light intensity signals of Yang et al. and Kiper. Additionally, it would have been obvious to combine use of CCDs to analyze signals to the method of using photodetectors to measure sample amount as in Yang et al. and Kiper to yield the alternate means of obtaining spectra and an alternate means of receiving the relevant signals. There would have been a reasonable expectation of success in combining Yang et al., Kiper, and French et al. because the general light intensity photodetectors of Yang et al. are generally applicable to the fluorescent particles in French et al. There would have been a reasonable expectation of success in combining a CCD of French et al. with the photodetectors of Yang et al. and Kiper because the charge coupled device of French et

al. allows an analogous means of measuring the light intensities of particles and converting them into electrical signals.

### ***Response to Arguments***

Applicant's arguments with respect to the instant claims have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

No claim is allowed.

Papers related to this application may be submitted to Technical Center 1600 by facsimile transmission. Papers should be faxed to Technical Center 1600 via the central PTO Fax Center. The faxing of such pages must conform with the notices published in the Official Gazette, 1096 OG 30 (November 15, 1988), 1156 OG 61 (November 16, 1993), and 1157 OG 94 (December 28, 1993)(See 37 CFR § 1.6(d)). The Central PTO Fax Center Number is (571) 273-8300.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Russell Negin, whose telephone number is (571) 272-1083. The examiner can normally be reached on Monday-Friday from 8:30 am to 5:30 pm.



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If attempts to reach the examiner by telephone are unsuccessful, the examiner's Supervisor, Marjorie Moran, Supervisory Patent Examiner, can be reached at (571) 272-0720.

Information regarding the status of the application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information on the PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/RSN/  
Russell S. Negin  
22 March 2010